

## A B S T R A C T

A METHOD AND APPARATUS FOR ANISOTROPICALLY ETCHING  
SILICON WITH A HIGH ASPECT RATIO

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According to the invention, a substrate (2)  
contained in an enclosure (1) containing an atmosphere  
(5) that is maintained at low pressure by a device (6, 7)  
for generating a vacuum is subjected to plasma etching.  
10 Plasma generation means (8) generate a plasma (9) which  
acts on the surface (2a) of the substrate (2). The  
etching method subjects the substrate (2) to an  
alternating succession of steps comprising: an attack  
step using a plasma of etching gas coming from an etching  
15 gas source (19), a second step of passivation by means of  
a plasma of passivation gas coming from a passivation gas  
source (20), and a pulse step of selective depassivation  
by the action of a plasma of a cleaning gas coming from a  
cleaning gas source (21) and serving to remove the  
20 polymer from the bottom zones of cavities (2b) more  
effectively than does the etching gas. This makes it  
possible to make cavities (2b) having an aspect ratio  
greater than 30, and to do so at higher speed, with good  
selectivity relative to the mask protecting the substrate  
25 (2).

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Translation of the title and the abstract as they were when originally filed by the  
35 Applicant. No account has been taken of any changes that may have been made  
subsequently by the PCT Authorities acting ex officio, e.g. under PCT Rules 37.2,  
38.2, and/or 48.3.